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Market Concentration and Stability of Nigeria's Deposit Money Banks: Evidence from Cross-sectional Data

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Abstract

Market concentration theories (hypotheses), and therefore bank stability can be determined either theoretically or empirically. Empirical evidence adopts analytical techniques while theoretical by concentration ratio measures. This study is basically theoretical, though, and therefore adopted the second approach. The study investigated the concentration implication of Deposit Money Banks in Nigeria (NDMBs) in order to prove the concentration-stability(fragility) hypothesis in the Nigeria's context. Theoretically, the study used cross-sectional data for a single year, computed for concentration ratios to determine the degree of concentration of the banks. Concentration ratio (C_{R5}) was employed as a measure for computation of documentary data obtained from the financial statements of 13 quoted sampled banks. The Herfindahl Hirschmann Index standard was used to reveal the level of the banks market concentration and, therefore stability as represented by the Z-score and liquidity. Despite its theoretical nature, the study adopted a methodological choice. The study used four systemic factors: profit after tax as proxy for market power, while banks credits, non-performing loans and liquidity as proxies for market share. Furthermore, cash and cash equivalent were employed as a proxy for banks liquidity. Using Herfindahl Hirschman Index standard, ratios obtained for liquidity, credits, profit after tax and nonperforming loans confirmed high market concentration of high Z-Score and liquidity, supporting concentration-stability (hypothesis) of the NDMBs. Except proved otherwise by empirical analysis and evidence, the banks currently enjoy stability and liquidity. Thus,a policy designed for competitive structure or deconcentration should be discouraged.

Keywords: Bank stability, Market concentration, Concentration ratio, Heffindahl Hirschmann index, cross-sectional data.
JEL Classification: G21, F36, L4, A12, C21

Contributions/Originality to Knowledge :
Motivated by the financial soundness of banks which in turn reinforces trust in the system and prevents phenomenon of banks runs, following that the real sector and the holistic economic performance of a nation is impacted by banks financial condition, more so, considering the concentration of the Nigerian banking system. This study is one or almost the only that have examined concentration-stability nexus of the Nigeria's Deposit Money Banks using Cross-sectional data and concentration ratio.

1.0 Introduction

Banks are a connecting rod to all sectors of an economy. Banks are therefore crucial for the existence of every economy. Banks channel funds from savers to users who are deficit in supply of funds. The intermediation role of meeting customers' demands on their deposits and also of the allocation of credits to the deficit unit of the economy cannot be performed except when banks are sound and healthy. The improper allocation of credits led to the collapse of the Lahman Brothers, a United States investment bank, following unbridle borrowings by top

American banks that culminated into colossal nonperforming loans which further led to the Global Financial Crisis (GFC) of 2007/2008 (Lall, 2014), causing lack of soundness and instability of the financial system (Oduor el al., 2017). The GFC affected not only developed but emerging economies notably South Africa and Nigeria. It shows contagion effect and the extent to which financial intermediaries control the real sectors of an economy. It also shows the magnitude of financial risks financial institutions could take to control market quality and ensure stability of the financial system.

Consolidation often results in the concentration and cost efficiency by eliminating strenuous capacities in data processing, overlapping in personnel, branch network and marketing activities of the banking system, issue appropriate loan contracts through zero adverse selection propelling stability (Ye, 2012; Chu, 2015; Kohler, 2015; Imegi and Wali, 2018; Ali and Puah (2019; Shim, 2019), be more profitable (Kohlscheen et al., 2018), because enlargement in bank size , increases in its market power, market share in assets, deposits, credits, earnings, efficient policies and also minimal toxic assets can favorably impact stability of banks (Barra and Zotti, 2019). Thus, bank market power implies bank capacity to influence the market price of its products or services by controlling its supply and demand, increase profitability by maintaining current and create potential customers (Barra and Zotti, 2019).

In the view of Barra and Zotti (2019), bank capacity to influence market price of products and services has a positive effect on its market share because bank market power or price as assumed by the Structure-Conduct-Performance theory enhances traditional income which further increases its market share in credits, while minimal or zero non-performing loans could enhance profitability, liquidity, solvency and stability of the bank. Also, bank profitability enlarges bank liquidity level, empowering the bank to mitigate the probability of insolvency and instability, increasing bank's capacity to perform its intermediation role of allocating credits to productive investment opportunities unhindered. However, the major issue that is of utmost concern after the Global Financial Crisis is the effect of market concentration on banking stability or fragility in emerging economies, and particularly given the consolidation, and the impact of the COVID-19 on the Nigerian banks and the global financial landscape.

Market quality and stability of the Nigerian Deposit Money Banks at pre-consolidation was at stake due to erosion of capital (undercapitalization), enormous losses, exacerbation of NPLs, illiquidity and fragility of the system (Lambert, 2016). This ugly situation led to the consolidation and further concentration of the Nigerian banks, enlarged banks size, restructured ownership and assets of the banks, increased their market power in profitability and market shares in credits and NPLs (Obilikwu, 2018). Unlike the U.S.A, France and U.K with bail-out funds of 115bn dollar, 500bn dollar and 850bn dollar respectively, the concentration of the NDMBs emerged prior to the GFC of 2007/2008 with a support for bail out of ₦620 billion for eight NDMBs in 2009 (Muritala et al., 2018). The study aims to theoretically look into market concentration and stability of the NDMBs for the year 2020 to ascertain hitherto the influence of the COVID-19 Pandemic on the liquidity with possible stability of the banks. There is a dearth of local literature on concentration-stability hypothesis using liquidity as a response factor by employing cross-sectional data and concentration ratio to measure stability. This is

the novelty in this study. The study is mainly restricted to theoretical concentration-stability using cross-sectional data and concentration ratio. The study is organized into (5) five sections. Section 1 is next to the introduction consisting of reviews on bank market concentration and stability, conceptual framework, concentration ratio, and issues on global and Nigeria's financial instability, while section 2 focused on theoretical literature, and empirical review. Section 3 presented the methodological choice. Section 4 presented data computation, measurement, as well as discussion on effect of market concentration. Section 5 presented conclusion and recommendation.

2.0 Literature Review

2.1 Bank Stability

Banks traditional income through interest earnings arising from credit allocation is most legitimate business model the world over. Banks capacity to withstand income volatility and uncertainties (Vallascas and Keasey, 2012), be profitable in the process of managing risk and maintain adequate liquidity (Arnold and Soederhuizen, 2018; Luc et al., 2020), could be stable to perform the intermediation role efficiently (Kusi et al., 2020)

2.2 Concept of Bank Market Concentration

Bank market Concentration is the level of control of economic activities by large banks, and increase concentration arises from dominance of large banks, while decrease is caused by reduction of dominant banks (Barra and Zotti, 2019). In this study, market concentration comprises of market power in profitability, and market share in credits, nonperforming loans and liquidity. **Market power** or rather pricing power refers to banks relative ability to influence the prices of their products and services by controlling the supply and or demand thereof (Ovi et al., 2014; Yusgiantoro et al., 2019). Thus, fewer banks imply greater ownership and market power available to each player for increase profitability (Qiubin, 2020). With decrease in number of the Nigerian Deposit Banks from 89 to 24, with a face of oligopolistic structure or market, the banks' have a combined market power (arising from the advantage of the consolidation) to manipulate both the supply and demand for financial products and services without losing their market share, and in turn realize abnormal profit margins through higher or abnormal rents.

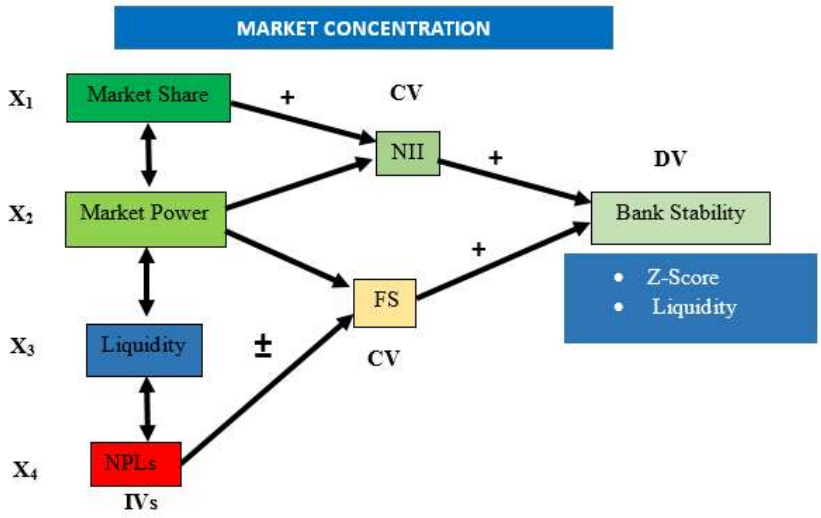
Market share, in general term is the proportion of sales, revenue, assets, credits, non-performing loans or policies relative or accountable to a firm or group of firms in an industry or market (Ernest, 2012). It indicates the total share of a firm or a combination of firms in a market owned by them. Such shares (for example, assets, credits, non-performing accounts) are used to measure the concentration ratio. Consolidation exercises often lead to size enlargement (for example, in ownership, assets, credits and NPLs) increase market share or concentration of the consolidated or merged firms. Early views of consolidation in banking, (Chu 2015; Kasman and Kasman, 2015) is that it leads to bank concentration, increase market share in equity capital, assets, customers/deposits liabilities, credits, NPLs and makes banks more cost-efficient enhancing stability. Thus, the authors are of the opinion that cost efficiency, quality deposits through quality customers could increase by bank concentration. International

researches have proved concentration levels to be a major determinant of banking system efficiency and stability (Akins et al., 2016). Figure 2.1 reveals market share, market power and bank stability nexus

2.3 Conceptual Framework

This study views bank stability as banks market power to be profitable, market share to issue appropriate loan contracts, design and implement appropriate monitoring procedures to minimize the incidences of NPLs, maintain adequate liquidity to perform the intermediation role undisturbed. While market power implies banks capacity to influence bank charges by controlling the supply and demand of products/services (Garza-Garcia, 2012; Barra and Zotti, 2019;), market share is the proportionate control of the banking market in credits, toxic assets, and liquidity (Ernest, 2012; Nguyen and Nghiem, 2016). It is a highly concentrated financial intermediary with adequate market power in profitability, market share in credits and minimal or zero NPLs to generate profits, remain liquid and solvent to perform its intermediation role efficiently. In this study, banking system stability is determined by inherent or systemic factors (profit after tax, credits, NPLs and liquidity) to avoid influence of externalities that often exert pressure on banks inherent factors (Ali and Puah, 2018) as in figure 1

Figure 1: Market Concentration-Stability Conceptual Framework



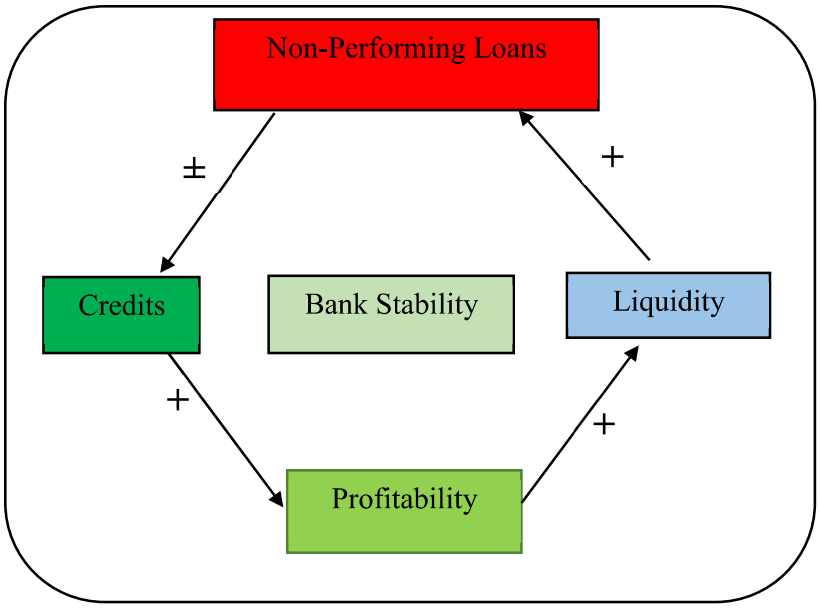
Source: Researchers' Conceptualization, 2022

Key

IVS – Independent Variables
DV – Dependent Variable
CV – Control Variable
NII – Net interest income
FS – Firm Size
FS – Firm's size
NPLs – Nonperforming Loans

Bank stability is ensured as much as there is growth in credits culminating but controlled by net interest earnings enhancing profitability and subsequent liquidity of the banks, however, jeopardized by credit risk of nonperforming loans adversely and completely negating the liquidity and consequential instability affecting the intermediation role of the banks. Furthermore, stability is a continuous revolve of credits, profitability, liquidity but adversely affected by nonperforming loans limiting banks intermediation role with possibility of bank runs.

Fig 2: Bank Stability Cycle



Source: Researchers' Conceptualization, 2022

The bank stability cycle shows the continuous revolving of the predictive variables as causative factors of the response variable that can be theoretically and empirically measured and analyzed by employing concentration ratio and the Z-Score statistic respectively.

2.4 Market Concentration Ratio and the Z-Score statistic

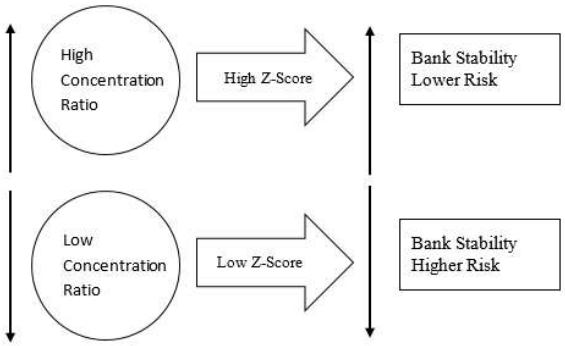
The concentration ratio indicates whether an industry is comprised of a few large firms or many small firms. For instance, the five-firm concentration ratio, which consists of the market share of the five largest firms in a market or industry, expressed as a percentage, is referred to as a concentration ratio. Similar to the concentration ratio five is ratio three, four, or eight. The eight-firm concentration ratio is calculated for the market share of the eight largest firms in an industry. This study shall employ concentration ratio five because of the reasonable number of the sample size of the banks. The most common measure used in literature on market concentration is the Herfindahl Hirschman Index (HHI), which is the total of the square of the dominance of k participants with highest shares (Kohler, 2015). A Herfindahl Hirschmann value of 1800 index or above indicates a highly concentrated market, and a value index between 1000 and 1800 points a moderately concentrated system, while a Herfindahl Hirschmann Index

of less than 1000 shows that the system is of low market concentration (Kohler, 2015). No canon for choosing an apt value of k, however, it is habitual to select three, four, five or eight participants. The systemic risk factors commonly employed to determine market concentration in an industry include market shares of firms held in either equity capital, liquidity, assets, loans, deposits, or NPLs ratio. The variables of interest in this study for determining the level of concentration after consolidation are banks credits, profit after tax, nonperforming loans and liquidity measured as bank concentration index of the highest five banks (CR_5). Thus, banks credits, profit after tax, nonperforming loans and liquidity are utilized for the determination and measurement. The concentration ratio (CR) adopted from Shijaku (2017) takes the form of the formula:

$$CR_k = \Sigma k_{i=j} = 1S^2 \tag{17}$$

Where *si* are dominance of k largest firms in the market. In this study, *Si* is the ratio of the share of the first- five largest banks profit after tax, credits and NPLs and liquidity in the banking industry in Nigeria. Concentration Ratio (CR_k) is a comparatively sturdy measure because it evidently sums/add up the market structure through market shares of a few dominating firms. Hence, if for the Nigerian money lending industry $CR_5 = 80$, then we can conclude the five biggest banks in Nigeria control 80% of the market share in Nigeria. The index is used on the premise that the behaviour of a market is controlled by a few-large banks. The CR_k index is efficacious to examine the market influence of a few dominating firms in the banking industry. In consonant with the market power hypothesis, it is expected that there would be linear relationship between bank market concentration and bank stability. The ease in computation is the comparative advantage of this ratio. Conversely, information of the entire market not captured in concentration measurement is major demerit. Relating concentration ratio to the Z-score statistic, figure 3 reveals the possible relationship in the study

Figure 3: Schematic Analogy of Z-Score Concentration-Stability Nexus



Source: Researchers' Work, 2022

Figure 3 depicts the assumed statistical market concentration and bank stability link. It is agreed in concentration-stability studies that a concentrated market, arising from consolidation, enjoys all the benefits of economies of scale is expected to earn higher profits with proportionate increase on return on assets. Thus, the Z-score is expected to rise in consonance with its

definition, because it is defined as the number of the standard deviations by which a bank's return on assets has to fall for the bank to become insolvent (Kohler, 2015). The statistical Z-score indicates the number of standard deviations below the expected value of a bank's return on assets at which equity is depleted and the bank is insolvent. Put the other way, the Z-score is the inverse of the probability of insolvency, such that, higher Z-score is inversely related to risk, and therefore the bank is stable as revealed in figure 3.

2.5 Key Issues about Global and Nigeria's Financial Instability

According to Lall (2014), global financial instability in the banking industry was first manifested during the Great Depression of 1929 to 1933. The author added that, the global financial system became impaired due to the global financial crisis of 2007/2008 after the fall of Lehman Brothers. Numerous rescue packages to restore the global economy were introduced by governments of some countries. For instance, in the United States of America, $115 billion dollars was disbursed to eight banks as bailout funds in 2008 (Lall, 2014). The author further mentioned that France and United Kingdom also bailed out with a tune of $500 billion and $850 billion respectively in 2008. The apex bank of Nigeria (CBN) rescued eight distressed banks in the country with an amount of ₦620 billion in 2009 (Muritala *et al.,* 2018).

In Nigeria, events of financial instability in the banking market have occurred within the eras categorised as the pre- Structural Adjustment Programme (SAP)-1970 to 1985, the SAP (1986 to 1999), and the Millennium (2000 to 2016) eras (Felix and Henry, 2019). According to the author, the pre-SAP era (1970 to 1985) marked the period prior to the introduction of SAP in 1986, and during this period, direct monetary policy approach, where sectoral allocation and credit ceiling tools in monetary policy management was employed, indicating a period of strict banking regulation following the establishment of the CBN in 1958. With severe regulation of interest rates and exchange rates, the Nigerian banks enjoyed comparative financial stability, forestalling major crises during the period, as the apex bank effectively monitored the market (Felix and Henry, 2019).

During the SAP (1986-1999) era, undercapitalization, bad loans, illiquidity and poor management policies became prevalent which caused many banks unable to withstand shocks (Lambert *et al.*, 2016). It is worth noting that in 1998 the licenses of 27 banks were withdrawn due to changes made in Banks and Other Financial Institutions Act (1991). (Lambert *et al.,* 2016). However, five banks were out of business in 1994, 17 were distressed in 1995 and were taken over by the CBN, and one was liquidated in 1996 (Atoi, 2018). During the period 1986 to 1999, indirect monetary transmission system was adopted, whereby open market operation, reserve requirement and moral suasion to manipulate monetary variables so as to achieve desired policy objectives were employed (Felix and Henry, 2019). The authors further asserted that monetary policy direction and the institutional framework provided by the CBN to control the banking environment could not resolve the problem of financial instability in the banking industry.

The millennium era was the period from 2000 to 2016. Financial instability worsened in this era due to continuous usage of indirect monetary policy. For instance, the bank consolidation

exercise reduced the number of banks from 89 to 25 in 2005 and further to 24 in 2007 spanning to 2008 (Lambert *et al.*, 2016). However, the continued instability in the banking industry in 2009 caused the CBN to conduct a special audit of all the 24 banks to authenticate their financial health. The result of the audit showed that many of the banks had serious liquidity and capital adequacy problems leading to the injection of ₦620 billion bail-out funds into eight banks in 2009 (Felix and Henry, 2019). The authors mentioned the banks to be, Afribank Plc, Finbank Plc, Oceanic Bank Plc, Union Bank Plc, Intercontinental Bank Plc, Platinum Habib Bank Plc (Bank PHB), Equatorial Trust Bank Ltd and Spring Bank Plc. The board of directors of these eight banks were changed while three of them (Afribank Plc, Bank PHB and Spring Bank) were nationalized and later sold off by the CBN (Felix and Henry, 2019). Subsequent mergers/acquisitions reduced the number of banks to 19 in 2015 (Ozili, 2019). The CBN also adopted several other supervisory measures termed macro-prudential policies in addition to the indirect monetary policy so as to effectively control the banking industry. However, these measures by the CBN did not solve the problem of financial instability as many banks suffered undercapitalization and assets quality problems (Ozili, 2019).

The CBN has introduced and implemented several measures to encourage financial stability in the banking industry since it came on board in 1958 (Jibrin *et al.*, 2020). Measures such as monetary policy and the establishment of the prudential guidelines for banks following the enactment of BOFIA in 1991 were employed (Jibrin *et al.*, 2020). The authors asserted that these measures intended to address the issues of incessant bank distress, bank failures and financial instability in the industry in general, and despite concentration policy by the CBN, financial instability still persists in the banking industry in Nigeria. The banking market could presently be battling with shocks of instability as could be witnessed from the rate of influencing withdrawals by customers, blocking of some automated teller machines (ATMs) and making them operational occasionally despite their functionality, waiting for lodgements to be received for ATMs to be filled to enable withdrawals, artificial incessant network failure, manipulating and programming ATMs with strange commands and language at excessive withdrawals possibly due to inadequate liquidity. Moreover, the NDMBs borrowed from the CBN ₦2.25trillion in the amounts of ₦1.81 trillion, ₦274.65billion, and ₦155.17billion in quarter 1, April and May 2020 respectively (Chukwuenyem, 2020).

These amounts were borrowed to enable the NDMBs perform their intermediation role and meet other banking obligations (Chukwuenyem, 2020). This portends illiquidity, tending to insolvency with the possibility of soaring instability. As posited by Shijaku (2017), bank market concentration can be stability enhancing (concentration-stability hypothesis) as well as a source of bank fragility (concentration-fragility hypothesis). However, banks in a concentrated system are more profitable (Kohlscheen et al., 2018), have higher credit growth, however, susceptible to credit risk (Pak, 2019), ensuring efficiency, enhancing stability, enabling the intermediation process (Ali and Puah, 2018; CBN, 2020). The study aims to theoretically investigate the concentration-stability hypothesis by examining market share in credits, nonperforming loans, liquidity and market power in profitability on the stability of the Nigeria's Deposit Money Banks.

2.6 Theoretical Literature

2.6.1 The Neoclassical Proposition

The neoclassical proposition, pioneered by Robert Solow and Trevor Swan (1956), stresses that investment or asset creation is a function of not only the lag in prices of assets but on the future yield or utility of such assets. In relation to bank stability, it is assumed that perfect competition (de-concentration) results in economic rationality giving rise to cost minimization which reinforces value to the consumer at cheaper prices, forestalling the incidence of credit risk default enhancing stability (Nguyen and Nghiem, 2016). Competition ensures zero excess in supply and demand, and the value of aggregate output is equal to aggregate payments or inputs. Thus, market forces are of extreme importance in the allocation of resources; therefore, consolidation (of the banks) through regulatory capital is deemphasized by the theory. Government, therefore, ought not intervene by regulating a system because market forces of supply and demand give rise and sustain full employment of all productive factors through competition (Ekpo, 2017).

Government should pursue appropriate policies avoiding inflationary or deficit spending (in cases of bail out for too-big-to-fail institutions), large external borrowings, but pursue vigorous education of the masses, promote by supporting enterprises, firms, and individuals by reduction of excessive taxes and levies, policies of equal rights, encourage foreign investment by ensuring a stable pollical system beneficial to the general economy (Ekpo, 2017). Thus, the failure to develop a system is primarily the result of too much government intervention and regulation of the economy (Solow and Swan, 1956) akin to the too-big-to-fail of the concentration-fragility nexus (Kusi *et al.*, 2020). However, a competitive system is prone to crisis due to risk-taking behavior arising from the competition.

2.6.2 The Structure-Conduct-Performance Theory

The Structure-Conduct-Performance (SCP) paradigm was published by Economists Edward Chamberlin and Joan Robinson in 1933, and progressed by Joe S. Bain in 1959 (Ye *et al.*, 2012). It is a pattern in Industrial Organization Economics that presents a causal theoretical explanation for firm performance through economic conduct on incomplete markets (Ye *et al.,* 2012). The constituents of the market which are structure, conduct, and performance relate to the kind of environment in which the firm or market operates, the behaviour of buyers and sellers to the framework of the industry, and the accomplishment of results in the market (Garza-Garcia, 2012). Thus, market power-profitability nexus is explained in the structure-conduct-performance (SCP) hypothesis (Garza-Garcia, 2012). The hypothesis posits that the structure of the market influences firms pricing conduct and ultimately performance. In this framework, the market power (MP) hypothesis argues that collusion among firms with MP results in higher pricing and profitability (Trujillo-Ponce, 2013). Applying to the banking markets, the MP hypothesis opines, banks with market power collude to charge high fees both on traditional and non-traditional activities but lower rates on customer deposits (Trujillo-Ponce, 2013). This is the major criticism against the Structure-Conduct-Performance theory.

Related to the MP hypothesis is the relative-market-power hypothesis that emphasizes on performance, efficiency and profitability through product differentiation and improved service quality which are often associated with the dominant firms in an industry that portray no collusive behaviour (Nguyen and Stewart, 2013). According to the author, bank profitability can be influenced by increased efficiency as underpinned by the Efficient Market Structure model that affirms that efficient firms enjoy lower production cost which translates into lower pricing resulting to increase sales, higher market shares, hence higher profitability. The SCP is useful in the prediction of the effects of external shock on an industry's profitability. It studies whether structure drives performance and also influence conduct and firms' profitability. According to Abdul Latif (2016), the model can be used to justify consolidation in the industry, highlight in structure which includes analysis of the industry's concentration, market power, efficiency, and profitability. Second, it highlights why industries/firms compete in prices, services, and product innovation. Third, it highlights firm's performance in regards to return on capital employed, economic profit, and shareholders returns (Abdul Latif, 2016).

2.6.3 Empirical Review

Deltuviate (2015), investigated market concentration-stability relationship. Using frequency and cost of banking crises as dependent variables, while concentration, efficiency and profitability as independent variables, incorporated macroeconomic and economic variables of GDP, inflation and GNI as moderating variables of 47 banking crises of 37 sampled banks from 160 developed and emerging economies for the period 1987 and 2007. Employing the HHI, simple and multiple regressions and the z-score statistic for measurement and analysis. Empirical result obtained provided evidence that banks in countries with concentrated banking system experienced lesser and fewer crises and cost of resolving such crises minimal supporting the concentration-stability hypothesis. Contrary to the concentration-stability nexus, Shijaku (2017), examined 16 Systemic Important and Non-systemic Important banks of the Albanian banking market for the period 2008 and 2015. The study used Financial Soundness Indicators of CAELS as dependent variables, while Banks Specific Factors of concentration, efficiency and leverage as independent variables. The study incorporated macroeconomic variables of GDP and sovereignty risk as mediating variables. The study employed the HHI and 2-stage GMM for measurement and analysis on a panel data of 448 observations for 28 periods. Empirical result obtained provided supportive evidence consistent with concentration-fragility view, while GDP and not sovereignty risk had positive impact on bank stability. Similarly, Cuestas (2019), assessed the potential non-linear relationship between competition (deconcentration) and bank risk for a sample of 40 commercial banks in the Baltic region over the period 2000 and 2014. Using the Lerner Index for deconcentration and the z-score statistic as proxy for bank risk. Empirical evidence provided support for U-shape correlation between competition and financial stability. That is, beyond a certain threshold, the lack of competition likely exacerbated the individual risk-taking behaviour of the banks which was detrimental to the stability of the banking sector in the Baltic region. Contrary wise, increased market power and market share decreased the risk-taking behaviour and the risk of insolvency for up to a particular level after which the relationship turned negative.

In Nigeria, Obilikwu (2018), examined the collision of bank capital, size, concentration and liquidity on the performance of 38 quoted and unquoted Nigerian commercial banks for the period 1980 and 2010. Incorporating macroeconomic variables of inflation and GDP, and employing the Vector Error Correction Model (VECM) for analysis. Result obtained confirmed that besides bank capital, bank size, concentration and liquidity negatively impacted the performance of the Nigerian commercial banks. Also, Kusi et al. (2020), analyzed the outcome of sectoral loan portfolio concentration on the stability of the Ghanian banking system for the period 2007 and 2014. Using a panel data of 30 Ghanian banks and a 2-step GMM, it was found that sectoral loan portfolio concentration weakened banks stability due to existence of NPLs confirming concentration-fragility nexus.

On the foreign scene, Deltuviate (2015), examined concentration-stability relationship using z-score model as well as frequency and cost of banking crises as dependent variables, while concentration (CR3), efficiency and profitability as independent variables. The investigated 47 banking crises of 37 commercial banks from 160 developed and emerging economies for the period 1987 and 2007. The study further incorporated economic and macroeconomic variables of GNI, GDP and inflation, employed the Pearson, Spearman, Partial correlations, simple and multiple regressions and the Z-Score statistic for analysis. Empirical evidence supported concentration-stability view for countries with concentrated banking system compared to a competitive structure. Similarly, Shijaku (2017) examined concentration-stability of the 16 Systemic Important and Non-systemic important of the Albanian banks for the period 2008 and 2015. The literature adopted the Financial Soundness Indicators of capital adequacy, asset quality, earnings, liquidity and sensitivity to market analysis as dependent variables and used concentration, efficiency and leverage as independent variables. The study incorporated GDP and sovereign risk as mediating variables while the HHI and 2-stage Generalized Method of Moment (GMM) were employed to measure for concentration and to analyse for banks risk respectively. Empirical result provided supportive evidence consistent with the concentration-fragility nexus while macroeconomic variables and not sovereign risk had significant impact on bank stability.

In Africa, Kusi et al. (2020) studied sectoral loan portfolio concentration of 30 Ghanian commercial banks for the period 2007 and 2014. Analysis was made on panel by the use of 2-stage GMM. Empirical result obtained confirmed concentration-fragility, and therefore instability of the Ghanian commercial banks due to exacerbation in nonperforming loans. In Nigeria, Obilikwu (2018) investigated the impact of bank size, capital, concentration and liquidity on the performance of 38 quoted and unquoted Nigeria's commercial banks for the period 1980 and 2010. The author incorporated macroeconomic variables of GDP and inflation, employed the Vector Error Correction Model for analysis. The study found that besides bank capital; bank size, concentration and liquidity negatively affected the performance of the Nigeria's commercial banks. This study, being theoretical, used a methodological choice and postulated a high Z-Score (see figure 2.3) as measured by the HHI with concentration-stability which aligns with the empirical works of Deltuviate (2015), and Shijaku (2017), but on the local scene, a departure from the status quo.

3.0 Methodological Choice

The population of the NDMBs as at 31st December, 2021 was 24 consisting of both quoted and unquoted banks. Using the stratified technique (Francis, 1998), the population of the study is 14 listed NDMBs. These are banks that have their financial statements and accounts published on the Nigerian Stock Exchange (NSE) for public consumption. The banks are: Access, Eco, FBN, Fidelity, FCMB, GTB, Jaiz, Sterling, Stanbic-IBTC, Union, UBA, Unity, Wema and Zenith banks. The purposeful or judgmental (deliberate) sampling (Hayslett, 1968) was used to filter out Jaiz bank established in year 2012, but quoted on the Exchange in 2017, with no longevity in study's parameters built for the years similar to other banks. Data for the study were sourced from the sampled banks. The data and information sourced were quantitative in nature. These sources are adjured better because they provide or make available financial information and data needed for investigation. Cross-sectional data were employed to compute for concentration ratios of the selected systemic factors and Herfindahl Hirschman Index as standard (Deltuviate,2015), to find out the degree of concentration and possible stability of the Nigerian Deposit Money Banks.

4.0 Data Computation and Measurement

This section, by concentration ratio computation investigated the collision of market concentration on bank stability in Nigeria. The study considered market power proxy by profit after tax, market share proxy by banks credits and non-performing loans, and liquidity proxy by cash and cash equivalents as systemic parameters prominent among the Financial Soundness Indicators that mostly enhance or endanger bank stability. These parameters were selected for the study because concentrated firms (banks) tend to have larger loans portfolio (credits) with significant losses (NPLs) which lowers profitability with adverse on liquidity negatively affecting the stability of the banking system.

4.1 Computation for Concentration Ratio

TABLES

(a) Cash & Cash Equivalents (C&C) (Liquidity)

Rank	Bank	Amount ₦	Computation	Ratio
1	Eco	1,627,575,837.12	1,627,575,837.12/2,819,414,179.71	57.73
2	Access	589,812,439.00	589,812,439/2,819,414,179.71	20.92
3	GTB	493,209,016.00	493,209,016/2,819,414,179.71	17.49
4	Wema	97,527,858.00	97,527,858/2,819,414,179.71	3.46
5	Unity	11,287,037.59	11,287,037.59/2,819,414,179.71	0.40
Total		**2,819,414,179.71**		

Source: Researchers' computation, 2022

$$CR_5 = \Sigma si^2$$
$$= (57.73)^2 + (20.92)^2 + (17.49)^2 + (3.46)^2 + (0.40)^2$$
$$= 4,088.431$$

(b) Profit After Tax

Rank	Bank	Amount ₦	Computation	Ratio
1	GTB	178,188,398.00	178,188,398/330,156,299.68	53.97
2	Access	106,009,695.00	106,009,695/330,156,299.68	32.11
3	Eco	38,305,716.68	38,305,716.68/330,156,299.68	11.61
4	Wema	4,592,217.00	4,592,217/330,156,299.69	1.39
5	FCMB	3,060,273.00	3,060,273/330,156,299.68	0.93
Total		**330,156,299.68**		

Source: Researchers' computation, 2022

$$\begin{aligned} CR_5 &= \Sigma si^2 \\ &= (53.97)^2 + (32.11)^2 + (11.61)^2 + (1.39)^2 + (0.93)^2 \\ &= 4,081.39 \end{aligned}$$

(c) Credits

Rank	Bank	Amount ₦	Computation	Ratio
1	Access	7,510,412,451.00	7,510,412,451/11,882,895,841.68	63.20
2	Eco	4,007,550,246.68	4,007,550,246.68/11,882,895,841.68	33.73
3	Wema	360,076,079.00	360,076,079/11,882,895,841.68	3.03
4	Zenith	2,639,797.00	2,639,797/11,882,895,841.68	0.02
5	FBN	2,217,268.00	2,217,268/11,882,895,841.68	0.02
Total		**11,882,895,841.68**		

Source: Researchers' computation, 2022

$$\begin{aligned} CR_5 &= \Sigma si^2 \\ &= (63.20)^2 + (33.73)^2 + (3.03)^2 + (0.02)^2 \\ &= 5,141.13 \end{aligned}$$

(d) Non-performing Loans

Rank	Bank	Amount ₦	Computation	Ratio
1	Eco	(78,744,036,60)	(78,744,036.60)/(126,300,591.60)	62.35
2	Access	(39,650,582.00)	(39,650,582)/(126,300,591.60)	31.39
3	Wema	(5, 635,165.00)	(5,635,165)/(126,300,591.60)	4.46
4	GTB	(2,221,501.00)	(2,221,501)/(126,300,591.60)	1.76
5	Union	(49,307.00)	(49,307)/(126,300,591.60)	0.04
Total		**(126,300,591.60)**		

Source: Researchers' Computation, 2022

$$\begin{aligned} CR_5 &= \Sigma si^2 \\ &= (62.35)^2 + (31.39)^2 + (4.46)^2 + (1.76)^2 + (0.40)^2 \\ &= 4,895.84 \end{aligned}$$

Decision Rule: The following decision rules apply:

HHI > 1800 ..... Highly concentrated market

HHI < 1000 ..... Low concentration

1000 < HHI ≤ 1800 ..... Average concentrated market

4.12 Effect of Market Concentration on Bank Stability

From Tables (a)-(d), it is evidenced that all systemic variables have concentration ratios as measured by the HHI significantly greater than 1800 standard index. Cash and cash equivalents, proxy used for liquidity had HHI of 4,088, while credits and NPLs, proxies used for market share had 5,141 and 4,895 HHI indexes respectively. Similarly, market power as measured by profit after tax had HHI index of 4,081. By the results of the variables, the Nigerian banking market is highly concentrated and therefore absent of crisis with high stability and liquidity. This agrees with the concentration stability hypothesis in Shijaku (2017), and Kohlscheen et al. (2018), that firms with high market power and market share are more profitable; with greater credit growth ratio, however, susceptible to risk (Pak, 2019), ensuring efficiency, enhancing stability, enabling the intermediation process (Ali and Puah, 2018; CBN, 2020). This also aligns with the Structure-Conduct-Performance proposition of Edward Chamberlin and Joan Robbinson (Ye et al., 2012) that framework of the market determines pricing behaviour among firms/banks because they collude to charge higher fees on both traditional and non-traditional income. Thus, the Nigerian banking system at post consolidation is characterised with features of concentration (non-competitive structure) portraying that most players in the market collude to charge higher bank charges and do not face systemic crisis of illiquidity but enjoy profitability through earnings gained from traditional income arising from their legitimate business model.

It also revealed that the impact of the COVID-19 Pandemic did not affect the bank liquidity causing instability of the system. The aim of the Central Bank of Nigeria in introducing the 2004 reform (consolidation) therefore, has enhanced healthy competition and efficiency among the Nigerian Deposit Money Banks in the supply of financial products and services with numerous Point of Sales (POS) across the country.

The rescue amount of ₦620 billion funds into eight banks to salvage their financial distress (Ozili 2019), the adoption of macro-prudential supervisory measures in addition to monetary policy in order to properly monitor the money lending market by the apex bank aided financial stability as banks sustained high profitability by raising and maintaining prices beyond the level that would prevail under competition or through excessive influence on rents (bank charges) by controlling the supply and demand of financial products and services by POS mechanism. Current healthy competition among banks results in banks offering value with utility in line with the Neoclassical proposition (Nguyen and Ngheim, 2016), that value in an asset is derived in its utility, satisfying the consumer thereby reducing the incidence of nonperforming loans. The queuing system for bank services could be to avert banking hall congestion, while incessant network failure could be adduced to localized branch or a bank-wide challenge, limited band width overstretched by increased traffic of transactions of which these

transactions are majorly salary induced, breakdown in Nigeria's Inter-bank Settlement System (NIBSS) platform which can create obstructions to successful end to end inter-bank transactions, and GSM default of service providers during such periods. Similarly, the CBN is the lender of last resort therefore, banks borrowing from the CBN aside from intra-bank borrowing is often done to arrest illiquidity challenge which is cheaper for the banks. These was possibly one of the reasons the CBN granted to the NDMBs a sum of ₦2.25trillion in the amounts of ₦1.81 trillion, ₦274.65billion, and ₦155.17billion in quarter 1, April and May 2020 respectively as stated by Chukwuenyem (2020). The theoretical concentration-stability outcome could possibly result in empirical concentration-stability using the Z-score statistic model in figure 2.2 which holds for concentration-stability for a highly concentrated banking system.

5.0 Conclusion and Recommendation

This research investigated concentration-stability nexus of Nigeria's banks using cross-sectional data for year 2020. Concentration ratio (C_{R5}) was employed to compute for ratios while the HHI used as a standard measure. The overall results rejected the concentration-fragility hypothesis whose proponents argue that concentrated firms, which are complex, enjoy government subsidy and inducements to take much risk, suffer adverse selection and moral hazards that can plunge the banking system into incidence of crisis, illiquidity and instability. Thus, the results contradict our expectations stated in the problem. Honouring customers for lodgement than other bank services, influencing bank charges, controlling the supply and demand for financial services, and borrowing from the Central bank were business strategies adopted by banks to increase profitability which in turn enhances stability. The study revealed that the Nigeria's banking system, in the COVID-19 Pandemic year was highly profitable, liquid and stable, and possibly to date.

This study used one country (Nigeria) and only four systemic variables. Other researchers can look at the dynamic correlation in concentration-stability prudential variables of equity capital, total assets, earnings quality, and micro variables of customers' deposits, sensitivity to market analysis and banks branch network.

Credit growth is imperative and indispensable for every profitable banking system as it is universally recognized as most legitimate line of business. Bank market concentration enhances credit growth with appreciative profitability enhancing liquidity ensuring stability of the banks. Except proved otherwise by empirical analysis using the Z-Score model and techniques of regressions, correlations, Generalized Method of Moment, Multivariate Analysis of Variance, Augmented Dickey Fuller technique, Vector Error Correction Model, T-test, Auto-regressive time lagged, it is recommended, regulatory authorities should deemphasize policies designed to deconcentrate the system because a competitive system, with many small size banks with demarketing activities, is prone to crises caused by risk-taking behaviour arising from the competition for credit extension not minding the risk in adverse selection and moral hazards which can be astronomical and catastrophic, translating into system fragility posing potential bank runs affecting the entire economic system.

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